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## *NexGenBus Simulations*

Details a Modeling and Simulation  
effort for the Next Generation  
Instrumentation Bus (NexGenBus)  
Program

## *Simulation Overall Objectives*

- Simulate Fibre Channel Topologies
- Simulate Message Latency and Throughput
- Simulate effect of Upper Layer Protocols
- Simulate different Classes of Service
- Simulate Synchronization

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## *Simulation Method*

- Generate Network Modeling and Simulation Plan
- Develop Baseline Model
- Build Lab Network
- Perform Verification on Baseline Model
- Document Initial Simulation Results

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## *Simulation Method (cont'd)*

- Generate Expanded Model Capabilities and Assumptions Document
- Build Small, Medium (today's max) and Large (tomorrow's max) Simulations
- Document results of Small, Medium and Large Simulations

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## *Baseline Model*

- Demonstrate the ability to produce model that matches the performance characteristics of a duplicate lab network
- FXLP protocol simulation in each transaction
- Fibre Channel data link uses vendor specifications

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## *Lab Network*

- Lab consists of two Pentium PC's
- NT 4.0
- Systran PCI card with FXLP drivers
- Twinax wires PC to PC
- Visual C++ program

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## *Initial Model Results*

- All file transfers performed 1000 times for statistical averages
- Simulation and Lab test throughput match within 5%
- Fibre Channel link not utilized over 50% during any of the file transfers
- Simulation and Lab message latencies match up to the 200Kbytes file size

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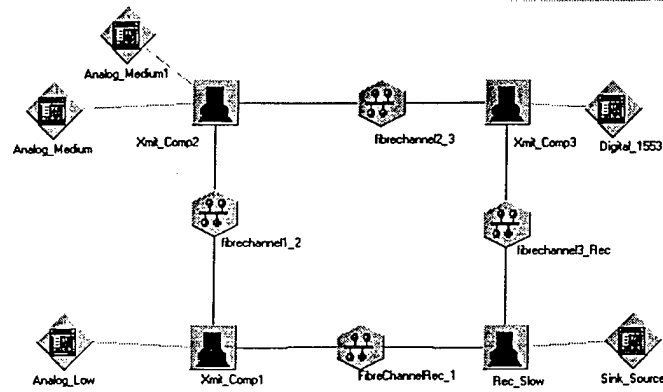
## *Expanded Models*

- Objective is to build on initial model to simulate small, medium and large NexGenBus Instrumentation system
- models consist of sources and sinks
- Models do not simulate at the physical or data encoding layer
- TCP/IP lab network tested

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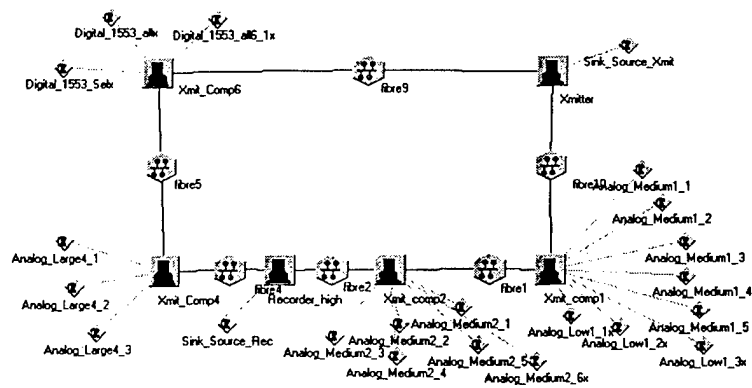
## Small Simulation



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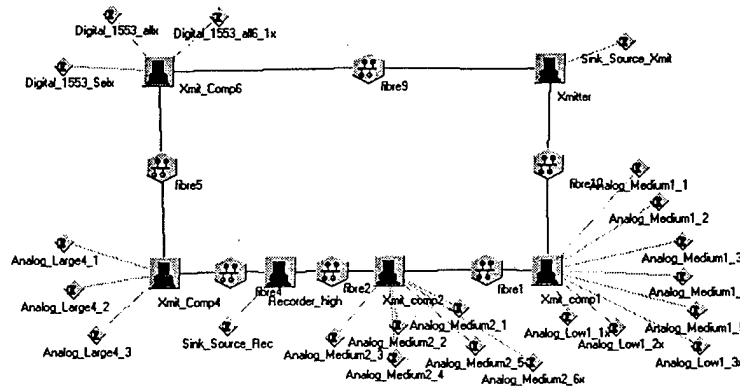
## Medium Simulations



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## Large Simulations



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## Expanded Model Results

- Talk about noticeable delay for small, medium and large models
- No topology changes on small, medium and large models
- class of service effects on small, medium and large models
- TCP/UDP/IP ULP discussions

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